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TITLE

SYSTEM AND METHODS
TO EFFECT RETURN OF A CONSUMER PRODUCT

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BACKGROUND OF THE INVENTION

Field of the Invention

- 10 The present invention is directed to a system and
method that utilize computers and a network to effect
the return of consumer products. In one preferred
embodiment, the invention is directed to a system and
method for facilitating the return of spent, recyclable
15 products from a consumer to a destination preselected
by the manufacturer for recycling.

Description of the Related Art

There are many circumstances in which it is desirable to move a product from a consumer back to a
5 manufacturer, for a variety of reasons. In the field of laser toner cartridges, for example, it is desirable to move a spent cartridge from the consumer back to the manufacturer, so that the manufacturer may recycle the cartridge. Such a system allows the manufacturer to
10 re-use some portions of the cartridge in order to fabricate new cartridges, and to reduce other portions to scrap materials which may also be re-used. Recycling a cartridge in this manner allows a manufacturer to fabricate new cartridges more cheaply,
15 and also has very positive effects on the environment.

U.S. Patent No. 5,965,858 to Suzuki, et al. proposes a manufacturer article recycling program. In that
20 patent, articles are manufactured at a manufacturing factory, delivered to stores, and purchased at stores by customers. After the customer has used the article for a given period of time, it is brought to a local deposit place (or to the store, which then sends it to the deposit place), where it is classified on the basis
25 of category or class, and then sent to an appropriate recycling facility. In Suzuki et al., however, there is nothing which addresses the particulars of how the article is moved from the customer to the deposit place.

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One conventional method of effecting the delivery of consumer product for recycle is to include with a newly purchased product a pre-authorized shipping label.

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Such a label is typically pre-printed with a pre-selected destination (such as the manufacturer's recycling facility), and is pre-authorized by a specific carrier (such as, for example, United Parcel
5 Service). When a consumer has exhausted the product and is ready to return it, the consumer locates the label that came with the product, locates a box in which to put the product, affixes the label and ships the product in the box with the label affixed.

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The above-described method is a generally good one, and has been used to effect extremely successful recycling programs. Nonetheless, it suffers from several
15 significant drawbacks, most of which stem from the fact that it basically a static, non-adaptable system which cannot be easily modified as circumstances change. For example, if the label included in the original packaging is lost, the consumer cannot readily effect the return of the product.

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Another drawback associated with the conventional method is that the manufacturer must select the destination of the consumer product return when the product is initially packaged, and cannot change the
25 destination thereafter. And because the selection must be made at the time the product is packed, before the manufacturer knows in whose hand the product will ultimately wind up, it cannot be tailored to a specific consumer. Thus, the manufacturer cannot direct the
30 consumer product to be returned to a destination closer to the consumer, thereby lowering shipping costs.

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Another drawback of the conventional method for handling product returns is that the method offers no mode for interaction with the consumer during the return process. In fact, a product manufacturer typically cannot tell where a returned package originated from, or whether the returned package contains the product at all. Indeed, unscrupulous individuals have been known to abuse the product return system by affixing a pre-authorized label to a non-authorized item, sometimes delivering an unwanted and bulky item to the product manufacturer's return destination.

Moreover, packing a pre-authorized shipping label with a consumer product locks in the manufacturer to the carrier service indicated on the shipping label. This reduces the ability of the manufacturer to negotiate among potential carrier services to obtain the lowest cost.

There is a need, therefore, for a system and method of effecting the return of a consumer product that takes an entirely fresh approach, and overcomes the drawbacks associated with the conventional methods discussed above.

SUMMARY OF THE INVENTION

It is an object of the invention to provide a system and method for effecting consumer product returns which overcome the drawbacks and disadvantages associated with the prior art methods.

In particularly preferred embodiments, the above-described computer adapted to perform functions (a) and (b) is the manufacturer's server computer, the other computer is a client computer operable by a consumer, and the network linking the two computers is the Internet.

In some embodiments of the present invention, a manufacturer's computer performs a method comprising the steps of (a) receiving consumer information from a first computer over a network, wherein said consumer information includes product type information; (b) storing the consumer information in a database server; (c) selecting a destination for said consumer product and a carrier in accordance with the consumer information; and (d) transmitting shipping label data

including said destination and carrier service to a client computer.

In some embodiments, the method includes a step of
5 comparing consumer information entered at the manufacturer's server computer with consumer information stored in one or more databases.

The invention is also embodied as a first computer
10 operable by a consumer and operatively connected to a printer. The first computer is located on a network linking it to a second computer. The first computer is adapted to: (a) transmit to the second computer consumer information including at least product type
15 information; (b) receive from the second computer shipping label data including an identification of a destination for the consumer product, selected in accordance with the consumer information, and an identification of a carrier service; and (c) transmit
20 shipping label data to the printer to cause a shipping label to be printed.

The invention may also be embodied as a system for effecting the return of a consumer product, which
25 includes (a) a first computer; (b) a network linking the first computer to a second computer, the second computer adapted to receive consumer information from the first computer over the network and to transmit shipping label data to the first computer; (c) a
30 printer operatively connected to the first computer and adapted to print a shipping label; and (d) a carrier service adapted to deliver the consumer product to a destination indicated in said shipping label.

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The invention is also embodied as computer code, running on a computer located on a network, for effecting the return of a consumer product, including:

(a) code for receiving from another computer located on the network consumer information which includes an identification of the consumer product to be returned;

(b) code for processing the consumer information and generating shipping label data; and (c) code for transmitting to the other computer shipping label data which includes an identification of a destination for the consumer product, selected in accordance with the consumer information, and an identification of a carrier service.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing and other objects, aspects and advantages of the present invention will be better understood from the following detailed description of preferred embodiments of the invention with reference of the drawings, wherein:

Figure 1 is a block diagram depicting elements of a system embodied according to the invention.

Figure 2 is a flow chart depicting operation of the system according to preferred embodiments of the invention.

Figure 2A is a continuation of the flow chart of Figure 2 from point ①.

Figures 3, 4, 5, 6, 7 and 8 are exemplary Web pages served by a Web server during operation of the system according to an embodiment of the invention.

5 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

10 "Consumer" means generally any person or entity who desires to return a consumer product. In preferred embodiments, the consumer is an individual or entity actually buying and using the consumer product to be returned, and about whom a consumer profile can be maintained. However, in the broadest embodiment, a consumer is simply an entity effecting the consumer product return.

15 "Manufacturer" means the person or entity organizing and authorizing the consumer product return. In preferred embodiments, the entity organizing and authorizing the consumer product return is, in fact, 20 the entity which actually manufactured the product, and uses the system of the present invention to track product usage information and consumer information, as will be discussed in greater detail below. Nevertheless, this is not required of the system and 25 method as broadly disclosed herein.

30 "Consumer product" or sometimes simply "product" means any product under the sun. In one preferred embodiment, the consumer product to be returned is recyclable product, such as for example a recyclable laser printer toner cartridge. However, the system and methods for effecting product returns according to the

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"Computer" may refer to a single computer or to a system of interacting computers. Generally speaking, a computer is a combination of a hardware system, a software operating system and perhaps one or more software application programs. Examples of computers include, without limitation, IBM-type personal

10 computers (PCs) having an operating system such as DOS,
Windows, OX/2 or Linux; Macintosh computers; hardware
having a JAVA-OS operating system; graphical work
stations, such as Sun Microsystems and Silicon Graphics
Workstations having a UNIX operating system;
15 PalmPilots; and PilotPCs.

"Network" means a connection between any two or more computers, which permits the transmission of data. An example of a network is the Internet.

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"User identification information" is consumer information that uniquely describes a consumer and includes, without limitation, user ID and password information.

25 "Web page" means any documents written in mark-up language including, but not limited to, HTML (hypertext mark-up language) or VRML (virtual reality modeling language), dynamic HTML, XML (extended mark-up
30 language) or related computer languages thereof, as well as to any collection of such documents reachable through one specific Internet address or at one

specific Web site, or any document obtainable through a particular URL (Uniform Resource Locator).

"Web site" means at least one Web page, and preferably
5 a plurality of Web pages, virtually connected to form a coherent group.

"Web browser" means any software program which can display text, graphics, or both, from Web pages on Web
10 sites. Examples of Web browsers include, without limitation, Netscape Navigator and Microsoft Internet Explorer.

"Web server" refers to a computer or other electronic
15 device which is capable of serving at least one Web page to a Web browser.

The phrase "display a Web page" includes all actions necessary to render at least a portion of the
20 information on the Web page available to the computer user. As such, the phrase includes, but is not limited to, the static visual display of static graphical information, the audible production of audio information, the animated visual display of animation
25 and the visual display of video stream data.

For the present invention, a software application could be written in substantially any suitable programming language, which could easily be selected by one of
30 ordinary skill in the art. The programming language chosen should be compatible with the computer by which the software application is executed, and in particular with the operating system of that computer. Examples

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of suitable programming languages include, but are not limited to, C, C++, CGI, Java and Java Scripts. Furthermore, the functions of the present invention, when described as a series of steps for a method, could
5 be implemented as a series of software instructions for being operated by a data processor, such that the present invention could be implemented as software, firmware or hardware, or a combination thereof.

10 An example of the system of the present invention is depicted schematically in Figure 1. As shown, the system includes Web server 110 (such as a manufacturer's Web server) operably connected to a database server 150 and a network 120. The network 120
15 may be, for example, the Internet. Also connected to the network 120 is a client computer 100 (such as a consumer's client computer), which in turn is connected to a printer (preferably a laser printer) 160 that can print a shipping label 170, in a manner that will be
20 discussed in greater detail below.

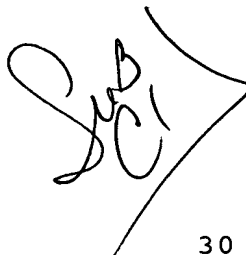
Preferably, the database server 150 comprises a relational database management system, in which stored information is arranged in tables of rows and columns,
25 related to one another by predetermined functions, and can be accessed by database query protocols, such as the Structural Query Language (SQL).

It will be readily appreciated that the schematic of
30 Figure 1 is exemplary only, and that numerous variations are plainly possible. For example, each of the computers 100 and 110 may be connected to their own network, which networks in turn are connected to

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network 120. The system may also be implemented with multiple client computers and multiple Web servers. Other variations exist as well.

5 Client computer 100 preferably includes communications hardware and an operating system with graphical user interface (GUI) functionality to allow for interface with the Internet, and is preferably equipped with graphical World Wide Web (Web) browser software, such
10 as Netscape Navigator or Microsoft Internet Explorer, loaded thereon and operable to read and send Hypertext Markup Language (HTML) forms from and to a Hypertext Transport Protocol (HTTP) server on the Web. Preferably, client computer 100 is operable to act as a
15 virtual machine to run Java applets, or the like, downloaded by the browser from the server. Specifically, the client computer 100 has to be capable of delivering consumer information to the manufacturer's server computer, as will be discussed
20 below. The Web server 110 preferably includes hardware, HTTP compliant software, an operating system and common gateway interface (CGI) software for interfacing with input queries and sources of data. The Web server 110 receives consumer information and
25 stores the consumer information in database server 150.

Turning to the operation of the invention according to a preferred embodiment, reference is made to Figure 2. As shown in Figure 2, a consumer who has decided to
30 return a product initially connects to the Web server 110 (step S210), to retrieve and display a Web page, such as for example by inputting the URL of such a Web page into the Web browser of the client computer 100.

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This action, routine in today's economy, is commonly referred to as "visiting the Web site" of the manufacturer. The URL may have been provided to the consumer in or on the original packaging of the goods,
5 along with instructions to retrieve Web page when it is desired to return the product.

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An exemplary Web page 30 that Web server 110 might serve to client computer 100 upon initial connection is
10 illustrated in Fig. 3. As is shown, this Web page asks whether the customer is a first-time user of the program or has used the program before (Step S220). Two buttons 31 and 32 are provided for customer response. If the consumer is a first time user, the
15 Web server will serve a Web page which allows the consumer to register with the program, such as the exemplary Web page 40 illustrated in Figure 4. This Web page is a CGI form that includes fields which allow (or require) the consumer to input various data, and a
20 submit button 41 to transmit that information to the Web server. Once the information is received, it is stored in the database server 150. The specific fields illustrated in Fig. 4 are, of course, only exemplary and other fields may be used in addition or in lieu of
25 all or some of them.

The consumer's name and address may be advantageously used to direct the consumer product to the facility closest to the consumer. For example, a particular
30 manufacturer administering a recycling program may elect to establish two recycling facilities, one on the East coast and one on the West coast of the United States. The manufacturer may require the location of

the consumer, so that it may direct the product to the one of the two facilities that is closest to the consumer.

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- 5 Upon submitting the form of Web page 40, the Web server serves a Web page, such as the Web page 50 of Fig. 5, that allows the consumer to specify a user identification ("user ID") and password. Once those data are received by the Web server, the Web server
- 10 stores them in the database server 150, and serves the client computer 100 a Web page confirming the user ID that the consumer specified (step S222), as illustrated in Fig. 6.
- 15 Once a user ID has been established by the Web server, the consumer does not have to undertake registration steps S221 and S223 to effect a product return. Rather, on second and subsequent visits, the Web server serves a Web page that provides a form for inputting the
- 20 already established user ID and password (step S222), such as Web page 70 illustrated in Fig. 7.

In an alternate embodiment, the user ID and password information is not entered manually by the consumer,

25 but is rather provided automatically via a cookie file placed on the client computer 100 by the Web server during the initial registration process.

In any event, upon receipt by the Web server of the

30 user ID and password information, the Web server performs a validity check (Step S224) to determine whether the user ID is valid. More particularly, the Web server compares the information received from the

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5 the Web page 70 to re-enter user identification.

20 product type information is subjected to the same type
of validity check as is performed in connection with
the validation of user identification information in
step S224, i.e. the entered product is compared with a
list of products maintained in database server 150, to
25 determine if it is a valid product. If it is not a
valid product, a suitable message is returned to the
client computer 100.

30 determined and shipping label data is transmitted, as
will be set forth below. In a preferred embodiment of
the present invention, the product identification
information includes not only information indicating

the generic type of the product (e.g. "laser toner cartridge"), but also an indication of the serial number of the specific product. In such a case, the serial number, too, is subjected to a validity check, by comparing it to serial numbers on a list of serial numbers maintained in the database server 150. In a preferred embodiment of the present invention, the Web server 110, after receiving product information from the client computer 100, will serve a Web page that provides a form for inputting information about the consumer's use of the product. Such use information might include such things as, for example, whether the consumer is using the product in a home or office setting; how much the consumer is using the product; how much the consumer paid for the product; where the consumer purchased or learned of the product; and myriad other data of interest to the manufacturer. This information, once received by the Web server, is stored in the database server 150. Such information allows the database server to maintain rich information not only with respect to a particular customer, but also with respect to the particular products that are returned.

In another preferred embodiment of the present invention, the consumer product is provided with a smart chip which collects information about the product during use. If the product is a printer cartridge, the information can include the number of prints made, the type of printer the cartridge is used in, or any other information about the product that a smart chip can be programmed to record. This information, once retrieved from the returned product, can be added to the database

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server 150. Product information gleaned from a smart chip may be associated in the database server 150 with a particular consumer through a product serial number, for example. In this manner, the manufacturer can even
5 more precisely monitor the life cycle of the product.

Once product information has been entered and received by the Web server, the Web server selects a product return destination for the consumer product, and a
10 carrier service that will handle the transport (step S240). Generally, the Web server 110 will determine the destination of the product in accordance with the product type sending the product to a facility at which it may be processed. For example, in the case of a
15 laser toner cartridge being returned for recycling, a destination will be chosen at which the recycling can be done. The destination may be further refined in accordance with the location of the consumer, selecting whatever suitable destination is closest to the
20 consumer in order to minimize shipping costs. The database server maintains a list of all available destinations, their locations and their processing capabilities, and is accessed by the Web server 110 in determining the destination for a particular product.

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Also maintained in the database server 150 is a list of all carrier services, and their charges for specified transports. The Web server 110 accesses this information as well, to determine which carrier service
30 is the most economical, given the nature of the product to be returned (such as its weight and dimensions) and the pick-up and delivery points. Preferably, the

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carrier server 150 is updated periodically, to reflect changes in rates, newly negotiated contracts, etc.

- Once a destination and a carrier service are selected,
- 5 the Web server generates shipping label data (step S250). The shipping label data include data sufficient for the client computer 100 to direct a printer 160 to print a shipping label that includes an identification of the destination and of the carrier service selected.
- 10 The shipping label data also include data necessary to print an actualization code on the label, indicating that the shipping of the package on which the label is affixed has been pre-authorized and that the receiver (i.e. the manufacturer) will pay the shipping costs.
- 15 The shipping label data also preferably, includes data necessary to print the sender's address. Such an enhancement provides a significant deterrent to abuse of the system.
- 20 The shipping label data is transmitted from the Web server 150 (step S260) and received by the client computer 100 (step S270) with the client computer operably connected to a printer 160 adapted to print shipping labels (step S280). In a preferred
- 25 embodiment, the shipping label data is transmitted and received in a format such that the consumer can cause labels to be printed without installing additional software on the client computer. In any event, the product to be returned is placed into appropriate
- 30 packaging by the consumer, and the printed label is affixed thereto.

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Variable	Mean	SD	Min	Max
Age	34.5	10.2	21	55
Gender	Male	Female		
Marital status	Married	Single		
Education	High school	College		
Occupation	Manager	Worker		
Income	Low	High		
Health status	Good	Poor		
Stress level	Low	High		
Life satisfaction	Low	High		
Resilience	Low	High		
Optimism	Low	High		
Self-efficacy	Low	High		
Perceived stress	Low	High		
Depression	Low	High		
Anxiety	Low	High		
Quality of life	Low	High		
Health-related quality of life	Low	High		
Physical health	Low	High		
Mental health	Low	High		
Social health	Low	High		
Environmental health	Low	High		
Overall health	Low	High		

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Depression	Low	High		
Anxiety	Low	High		
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Overall health	Low	High		

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Life satisfaction	Low	High		
Resilience	Low	High		
Optimism	Low	High		
Self-efficacy	Low	High		
Perceived stress	Low	High		
Depression	Low	High		
Anxiety	Low	High		
Quality of life	Low	High		
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Mental health	Low	High		
Social health	Low	High		
Environmental health	Low	High		
Overall health	Low	High		

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Self-efficacy	Low	High		
Perceived stress	Low	High		
Depression	Low	High		
Anxiety	Low	High		
Quality of life	Low	High		
Health-related quality of life	Low	High		
Physical health	Low	High		
Mental health	Low	High		
Social health	Low	High		
Environmental health	Low	High		
Overall health	Low	High		

shipping labels can be affixed are mailed to the receiving site. Transmitting and receiving of shipping label data and printing of shipping labels proceeds as in the above-described embodiments. Several products
5 are loaded into the boxes and the boxes are delivered to the selected destination by the carrier service.

The foregoing detailed description is intended to be illustrative and not limiting of the invention, which
10 is defined by the appended claims. For example, although much of the above description is with respect to a recycling program, the systems and methods of the present invention may be used to effect product return for any reason, such as product service, product
15 repair, customer dissatisfaction, etc. Various other modifications are possible as well.

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